Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

cocious branch originated near the callus which had formed over it.

The importance of this curious case of precocity is its possible bearing upon the production of earlier developing varieties of shade or fruit trees. The literature may be full of references to the matter, but so far as I am aware no one has made the attempt to originate an early leafing variety of ornamental trees by wounding the branches and looking for precocious shoots from the wounds, from which to propagate by buds or cuttings. It is possible that cuttings taken from a branch originating in this way may prove no earlier than the mother plant, but there is also a possibility that the wound has led to the production of an adventive bud which has varied in the direction of precocity.

I am confident that in such cultures as the hop, where the plant has been propagated asexually for centuries, bud variation plays an important part in the formation of new strains or races; and new Citrus varieties are suspected to have originated in this way. Just how great this variation is, and how often it can be utilized, remains a question for research. The case here described seemed so striking that I thought it worthy of a short note and a photograph. There was no sign of the branch having been budded with a different variety, and, unfortunately, I do not know the species of the tree. In fact, the interest of the case only appeared to me after I was many miles away from Patras.

It would be interesting to know whether the same branch developed a second year much earlier than the other branches of the tree, *i. e.*, whether this precocity was the result of a direct but transitory stimulus of the wound, or a constant character of the bud produced near the wound.—DAVID G. FAIRCHILD, *Department of Agriculture, Washington, D. C.*

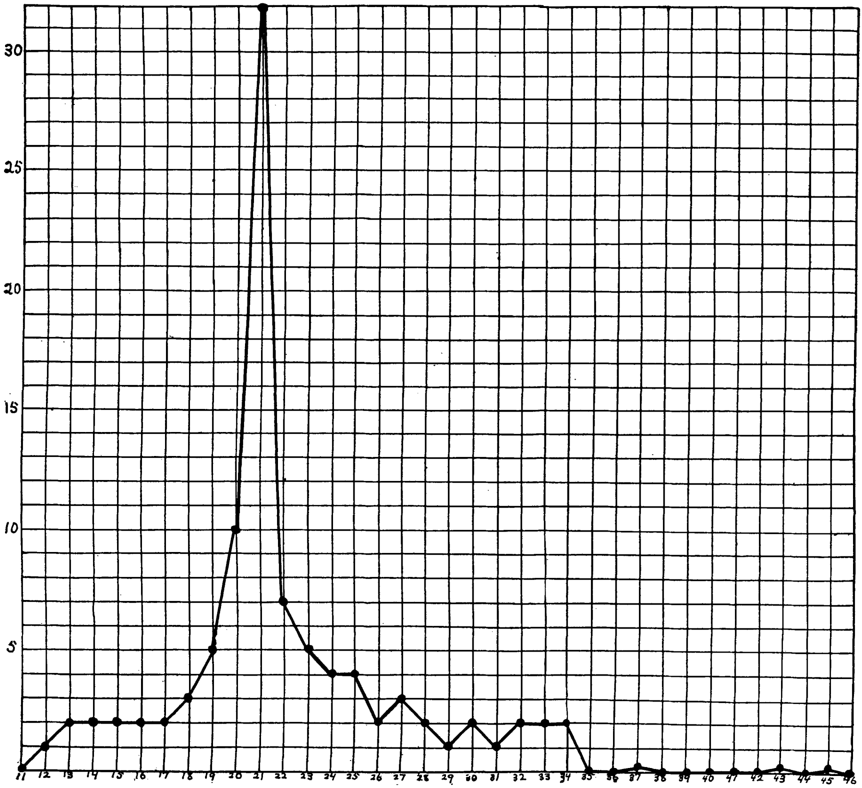
NUMERICAL VARIATION OF THE RAY FLOWERS OF COMPOSITÆ.[1]

(WITH ONE FIGURE)

THE following observations constitute a preliminary report upon the variation, both numerical and morphological, exhibited by the flowers and inflorescence of the Compositæ, a subject which I have had under investigation for several years. The present paper treats only of the numerical variation found in the ray-flowers of *Helianthus annuus*. These particular studies were completed while I was connected with the Oklahoma Agricultural and Mechanical College. I take pleasure in acknowledging my obligations to Mr. A. C. Lewis of that institution for assistance.

---

[1] Contributions from the Laboratory for Plant Physiology and Pathology of the Alabama Polytechnic Institute. I.



Curve of variation.

If we may judge from some recent utterances of botanists and zoologists, is is evident that the mathematical and statistical study of variation is destined to occupy a prominent part in the development of biological research. Dr. Robinson, in his address as retiring President of the Botanical Society of America, said, "that among the subjects which seem to invite immediate attention the most important are : (1) the determination of the modes and degrees of variation, an investigation which alone can yield data for a more critical discrimination of plant categories."[2] Equally forceful words were spoken by Dr. Davenport in his address as retiring vice-president of Section F of the A. A. A. S. at its Denver meeting. He said[3] "the science of variation is therefore one of those that we may hope to see established in this century. I feel convinced that statistical studies are first of all necessary to lay the foundations of the science." The recent establishment of the periodical "Biometrika" will do much to increase the general interest in this department of biological investigation.

The specimens of *Helianthus annuus* selected for this study were growing on vacant lots in Stillwater, Oklahoma, forming there the typical sunflower waste-formation so characteristic of that region. Determinations of the number of ray flowers were made on a total of 1103 heads selected at random over the various vacant lots. The following tabulation and curve of variation show the results thus secured.

Class	Individuals in the class	Percentage of individuals in the class	Percentage of individuals in this or a higher class
12	10	0.90	100
13	22	1.99	99.09
14	23	2.08	97.09
15	25	2.26	95.01
16	22	1.99	92.74
17	26	2.35	90.75
18	40	3.62	88.39
19	50	4.53	84.76
20	112	10.15	80.23
21	352	31.91	70.08
22	80	7.25	38.16
23	50	4.53	30.91
24	40	3.62	26.38
25	42	3.80	22.75
26	25	2.26	18.94
27	36	3.26	16.68
28	18	1.63	13.41
29	16	1.45	11.78
30	26	2.35	10.33
31	15	1.35	7.97
32	25	2.26	6.61
33	20	1.81	4.35
34	25	2.26	2.53
35	0	0	0.27
36	0	0	0.27
37	1	0.09	0.27
38	0	0	0.18
39	0	0	0.18
40	0	0	0.18
41	0	0	0.18
42	0	0	0.18
43	1	0.09	0.18
44	0	0	0.09
45	1	0.09	0.09

From the above tabulation and frequency curve the following facts are secured. The class having 21 ray flowers includes over 31 per cent. of all the individuals. Slightly over 10 per cent. of all the individuals are segregated in classes 30 to 34 inclusive, while only 3 individuals were found having more than 34 ray flowers.

---

[2] ROBINSON, B. L., Problems and possibilities of systematic botany. Science 14:474. 1901.

[3] DAVENPORT, C. B., Zoology of the twentieth century. Science 14:319. 1901.

The curve shows a positive skewness of 1.1, but at present it cannot be stated whether this skewness is toward or away from the ancestral condition of the species. Seeds collected from heads having given numbers of ray flowers have been secured for breeding purposes and the study of the plants thus secured may enable us to properly interpret the skewness here observed.—E. MEAD WILCOX, *Alabama Polytechnic Institute, Auburn.*